

Application No. 09/988,940
Amendment dated 3 March 2006
Reply to Office Action of 3 November 2005

REMARKS

Claims 1, 3-12, 14-18, 20-22, and 24-36 are pending after this amendment.

Claim 18 is allowed.

The Office Action indicates that claim 6 would be allowable if presented in independent form. This has been done by incorporating into claim 6 the features of claims 1, 2 and 3.

Claim 7 depends from claim 6. Therefore, claims 6 and 7 are submitted to be allowable.

The Office Action indicates that claim 8 would be allowable if presented in independent form. This has been done by incorporating into claim 8 the features of claims 1 and 2. Claims 9 to 11 depend from claim 8 and are therefore submitted to be allowable.

The Office Action indicates that claim 24 would be allowable if presented in independent form. This has been done by incorporating into claim 24 the features of claims 19 and 23. Claim 20 has been amended to depend from claim 24. Claims 21-22 and 25-29 depend from claim 20. Therefore, claims 20-22, 24 and 25-29 are submitted to be allowable.

In light of the above, all of claims 6-11, 18, 20-22, 24 and 25-29 are submitted to be allowed or allowable.

Compliance of Claims with 35 U.S.C. §103

Cited Art

As understood, Delvaux discloses multi-channel communication links. Delvaux discloses, as background, inverse multiplexing for ATM (IMA) (col. 2, ln. 29-48).

As understood, Khotimsky et al. disclose a method for restoring the original order of packets in an end-to-end data flow that has been transmitted over a set of paths. The method involves performing packet block enumeration for pairs of paths. Khotimsky et al. indicate that differential delay ("skew") among the different paths can cause data segments to arrive out of order.

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Claim 1

Claim 1, as amended, recites that:

- each sub-stream carries every N^{th} cell of the one high-rate data stream;
- the first demultiplexer is configured to stagger transmission of cells in the sub-streams in time with respect to one another;
- the first transmit control circuit is configured to enable and disable a respective one of the data transmitting devices according to a status of a receiver enable signal (RxEnb) received over said mid-plane from the data receive interface; and,
- the data passes across a mid-plane.

Applicant submits that the prior art fails to suggest the combination of features recited in amended claim 1.

The Office Action indicates that Khotimsky discloses use of a flow control signal at col. 6, ln. 26-33. This appears to be incorrect. The passage of Khotimsky referred to in the Office Action does not discuss flow control signals at all.

Further, in the Khotimsky et al. methods, each sub-stream does not carry every N^{th} cell of the one high-rate data stream, as claimed. None of Figures 4, 6 or 7 which show the allocation of packets to paths have this characteristic.

Further, neither Delvaux or Khotimsky discloses passing data across a mid-plane.

Therefore, claim 1 is submitted to patentably distinguish the cited combination of Delveaux and Khotimsky.

Claims 3-5 and 33-36 depend from claim 1 and are submitted to be patentable over the cited references for at least this reason.

Claim 12

Claim 12 recites "control means for commencing the transmission of individual cells to the receiver, in the order, at times staggered relative to one another by a time difference ΔT that exceeds a worst case inter-channel difference in latency for transmission of cells from the transmitting means to the receiver by way of the mid-plane". This guarantees that cells

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will arrive at the receiver in order. Therefore, no resequencing at the receiver is required. This feature is not provided by the cited references in the claim 12 context.

Delvaux uses sequence numbers to re-order packets that have been transmitted across a multi-channel communication link (140) (see col. 16, ln. 37-46). Khotimsky et al. reconstruct an original packet transmission order by performing packet block enumeration for path pairs.

The Office Action refers to col. 6, ln. 26-33 of Khotimsky et al. This passage describes packets being divided among several subflows with reference to Figures 3 and 4. Figure 4 of Khotimsky et al. shows a transmission order of packets and is not a timing diagram. The referenced passage of Khotimsky et al. is in a section entitled "Asynchronous Resequencing Techniques" this indicates that the packets are not transmitted at specific staggered times. This passage does not remedy the failure of Delvaux to disclose the claim 12 features.

The Office Action refers to col. 7, ln. 5-6 of Khotimsky et al. This passage describes an ATM connection splitting model in which individual paths have different bandwidths that vary in time. This passage does not remedy the failure of Delvaux to disclose the claim 12 features.

Furthermore, both Delvaux and Khotimsky et al. provide resequencing of received packets. In the apparatus of claim 12 resequencing is unnecessary to preserve cell order because the cells are guaranteed to arrive in order at the receiver.

Further, neither of Khotimsky et al. and Delvaux discloses transmitting data across a mid-plane.

Claims 14-17 depend from claim 12 and are submitted to be allowable for at least this reason.

Claim 30

Claim 30 recites "receiving the transmitted cells at a receiving device in the same order that the cells were transmitted". None of the methods disclosed in Delvaux or Khotimsky et al. that involve resequencing have this feature.

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Claim 30 also recites "each of the channels having a recurring cell transmit time, the cell transmit times for successive channels staggered relative to one another by amounts exceeding any inter-channel differences in skew and latency".

Neither Delvaux nor Khotimsky et al. appear to disclose this feature. The Office Action refers to the passage of Khotimsky et al. at col. 2, ln. 8-14. This passage discusses the fact that different paths may provide differential delays and that a re-assembly engine is required to buffer data to allow for reconstruction of the aggregate flow. This passage does not disclose providing recurring cell transmit times for different channels that are staggered relative to one another, as claimed in claim 30.

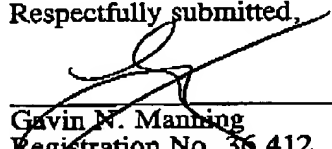
Therefore, claim 30, and claims 31 and 32 which depend from claim 30 are submitted to be patentable over the combination of Delvaux and Khotimsky et al.

The Applicant submits that the claims, as amended, are in condition for allowance.

The Applicant requests reconsideration and allowance of this application in light of the foregoing amendments and remarks.

Respectfully submitted,

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